

TRANSMITTAL OF APPEAL BRIEF (Large Entity)

Docket No.
08CS966-2

In Re Application Of: MAO CHEN

Serial No.
10/062,646Filing Date
January 31, 2002Examiner
XiaGroup Art Unit
1772

Invention: ANTI-FOG COATING COMPOSITION, PROCESS, AND ARTICLE

TO THE COMMISSIONER FOR PATENTS:

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Docket No. 08CS5965-2

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT:	MAO CHEN)	
SERIAL NUMBER:	10/062,646)	
FILED:	January 31, 2002)	Appeal No.: 1
FOR:	ANTI-FOG COATING)	
	COMPOSITION, PROCESS, AND)	
	ARTICLE)	

APPEAL BRIEF

I. REAL PARTY IN INTEREST

The real party in interest in this appeal is General Electric.

II. RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences known to appellant, appellant's legal representatives, or assignee which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

III. STATUS OF THE CLAIMS

Claims 3, 5-8, 18, 20, and 31-33 are pending in the application. All of the pending claims stand rejected. The rejection of claims 3, 5-8, 18, 20, and 31-33 is appealed.

IV. STATUS OF AMENDMENTS

All submitted amendments have been received and entered. Claims 3, 5-8, 18, 20, and 31-33 stand as presented in Appendix A.

V. SUMMARY OF THE INVENTION

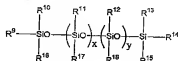
The application discloses and claims an anti-fog composition comprising a silicone compound, a water dispersible polyurethane compound and water. The application also discloses and claims a glass or plastic article having an anti-fog coating, comprising a silicone compound, a water dispersible polyurethane compound and water, disposed on at least one surface of the article. The silicone compound may be chemically bonded to the polyurethane.

The silicone compound may have one of two formulas. The first formula is



wherein the subscripts a, c, d, e, f, and g are zero or a positive integer, subject to the limitation that the sum of the subscripts b, d, and f is one or greater; M has the formula: $R^1_3 SiO_{1/2}$, wherein each R^1 is independently a monovalent hydrocarbon radical having from one to forty carbon atoms; M' has the formula: $R^2_{3-h} R^3_h SiO_{1/2}$, wherein each R^2 and R^3 are independently monovalent hydrocarbon radicals having from one to forty carbon atoms, and the subscript h is 1, 2, or 3; D has the formula: $R^4_2 SiO_{2/3}$, wherein each R^4 is independently a monovalent hydrocarbon radical having from one to forty carbon atoms; D' has the formula: $R^5_2 R^6_2 SiO_{2/3}$, wherein each of R^5 and R^6 is independently a monovalent hydrocarbon radical having from one to forty carbon atoms, and the subscript i is 1 or 2; T has the formula: $R^7 SiO_{3/2}$, wherein each R^7 is a monovalent hydrocarbon radical having from one to forty carbon atoms; T' has the formula: $R^8 SiO_{3/2}$, wherein R^8 is a monovalent hydrocarbon radical having from one to forty carbon atoms; and Q has the formula: $SiO_{4/3}$. Each element of the formula, other than Q, comprises at least one organic radical but in each instance the organic radical is limited to a hydrocarbon radical. Because Q, by definition, is a non-terminal component of the formula it is clear that the all compounds falling within the definition of the above formula have only hydrocarbon terminal groups. A hydrocarbon is commonly defined as being completely composed of carbon and hydrogen atoms.

The second formula is an ionic or nonionic siloxane alkoxyate of the formula:



wherein each of R^9 through R^{17} are independently a monovalent hydrocarbon radical, and R^{18} is $R^{19}-Z-(C_mH_{2(m-1)}R^{20})_j(C_nH_{2n}O)_kR^{21}$, wherein m and n are integers greater than or equal to 0; j and k are integers greater than or equal to 0, subject to the proviso that the sum of $j + k$ is greater than or equal to 1; Z is $-O-$, $-S-$, $-CO-$, $-NH-$, or $-NH_2$; R^{19} is a divalent hydrocarbylene radical, R^{20} and R^{21} are independently hydrogen, alkyl, hydroxyalkyl, amino, amide, amineoxide, cyano, isocyano, aryl, arylene, carboxy, alkoxy, halogen, haloalkyl, haloalkoxy, sulfo, sulfamo, phosphono, salts thereof, or a combination comprising at least one of the foregoing moieties, and wherein x and y are integers greater than or equal to 0, subject to the proviso that $x + y$ is greater than or equal to 1.

The second formula differs from the first formula in that there is a non-hydrocarbon functionality but the non-hydrocarbon functionality is a pendant group and not a terminal functionality. Thus it is clear that silicone compounds represented by either formula have only hydrocarbon terminal functionalities.

VI. ISSUES

1. Claims 3 and 6-7 stand rejected under 35 U.S.C. § 102(b), as allegedly anticipated by U.S. Patent No. 4,499,149 to Berger.

2. Claims 8 and 31 stand rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over U.S. Patent No. 4,499,149 to Berger.

3. Claims 3, 5-8, 18, 20, and 31 stand rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over U.S. Patent No. 5,932,405 to Anderson et al. in view of U.S. Patent No. 4,499,149 to Berger.

4. Claim 32 stands rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over U.S. Patent No. 4,499,149 to Berger.

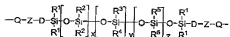
VII. GROUPING OF CLAIMS

The claims stand together.

VIII. ARGUMENT

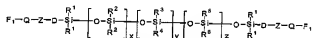
1. Claims 3 and 6-7 are patentable under 35 U.S.C. § 102(b), over U.S. Patent No. 4,499,149 to Berger.

Berger generally discloses polymeric compositions containing polysiloxane units of the formula



where Q is a substituted or unsubstituted aromatic group; Z is ---O--- , ---S--- , ---S(O)--- , $\text{---S(O)}_2\text{---}$, $\text{---S(O)}_2\text{NH---}$, ---NHS(O)--- , ---C(O)NH--- , ---NHC(O)--- , ---C(O)O--- , or ---OC(O)--- ; D is unsubstituted or substituted hydrocarbylene. Thus the terminal groups, Q-Z-D, are not hydrocarbons due to the required presence of one or more non-carbon, non-hydrogen atoms.

The polysiloxane unit of Berger includes the entirety of the above formula and the above formula does not include any units of the polymer to which the polysiloxane may be bound. Support for this assertion can be found in the manner in which the polysiloxane unit is bound to or incorporated into the polymer. Beginning at Col. 3, line 9, Berger teaches that the polysiloxane unit of the above formula is incorporated into the polymeric composition by reacting a bis(functional) polysiloxane of the formula



where F_1 is a functional group attached directly to Q or bonded via an intermediate aliphatic group, with the appropriate monomers to form the polymer having the incorporated polysiloxane unit. F_1 can be any one of a group of highly reactive species that functions as a leaving group during the formation of a chemical bond between Q and the reactive end group of a polymer or between Q and a monomer. The incorporation of the bis(functional) polysiloxane is described with regard to polyimides beginning at Col. 16, line 38 where the bis(amino)polysiloxane is reacted with a dianhydride. Similarly it is described with regard to polyamide-imides beginning at Col. 39, line 13, with regard to polycarbonates beginning at Col. 41, line 26, with regard to polyphenylene sulfide beginning at Col. 42, line 52, and with regard to polysulfone beginning at Col. 44, line 5. In each case, the chemical variable Z is included as part of the polysiloxane unit and is not part of the reactive moiety that links the polysiloxane unit to the remainder of the polymer. Thus it is clear that Z is part of the terminal moiety of the polysiloxane unit, not

the bonded polymer. With this in mind it is clear that Berger does not teach a silicone compound having only hydrocarbon functionality at the terminal silicon atoms. Berger teaches a polysiloxane that contains non-hydrocarbon functionality at the terminal ends of the siloxane moiety (see the Z group: $-O-$, $-S-$, $-S(O)-$, $-S(O)_2-$, $-S(O)_2NH-$, $-NHS(O)_2-$, $-C(O)NH-$, $-NHC(O)-$, $-C(O)O-$, or $-OC(O)-$).

In contrast the instant claims, as discussed above, are directed to a composition comprising a silicone compound in which all terminal groups are hydrocarbons. To anticipate a claim under 35 U.S.C. § 102, a single source must contain all of the elements of the claim. *Lewmar Marine Inc. v. Barient, Inc.*, 827 F.2d 744, 747, 3 U.S.P.Q.2d 1766, 1768 (Fed. Cir. 1987), *cert. denied*, 484 U.S. 1007 (1988). Since Berger does not teach a silicone compound having only hydrocarbon terminal groups, Berger does not anticipate the instant claims.

2. Claims 8 and 31 are patentable under 35 U.S.C. § 103(a) over U.S. Patent No. 4,499,149 to Berger.

Claims 8 and 31 are dependent upon Claim 3 and as such require the presence of a silicone compound in which all terminal groups are hydrocarbons. For an obviousness rejection to be proper, the Examiner must meet the burden of establishing a *prima facie* case of obviousness, i.e., that all elements of the invention are disclosed in the prior art. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988); *In re Wilson*, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970); *Amgen v. Chugai Pharmaceuticals Co.*, 927 U.S.P.Q.2d, 1016, 1023 (Fed. Cir. 1996). Since Berger does not teach a silicone compound having only

hydrocarbon terminal groups, Berger does not provide adequate basis for a prima facie case of obviousness.

3. Claims 3, 5-8, 18, 20, and 31 are patentable under 35 U.S.C. § 103(a) over U.S. Patent No. 5,932,405 to Anderson et al. in view of U.S. Patent No. 4,499,149 to Berger.

Anderson generally discloses a photographic element which includes a support, at least silver halide light sensitive layer superposed on the support, and an outermost protective overcoat superposed on the support. The protective overcoat includes a water dispersible siloxane-containing polyurethane.

Claim 18 is directed to a glass or plastic article having an anti-fogging surface comprising a glass or plastic substrate and an anti-fog coating disposed on at least one surface of the substrate. The anti-fog coating comprises the anti-fog coating composition of Claim 3. Claims 5-8 and 31 are dependent on Claim 3 and Claim 20 is dependent on Claim 18.

The Examiner has stated, "Anderson does not disclose the same silicon compounds as recited in claims 3 and 18." (Office Action dated 6/5/2003, page 7) The Applicant agrees with this statement. The Examiner further stated, "the composition [of Berger] comprises the same material as claimed in claims 3 and 18." (Id.) The Applicant respectfully disagrees that Berger teaches the same compounds as required by independent Claims 3 and 18. As described above, Berger's compounds do not teach or suggest either one of the two types of silicone compounds required by the claims. As

Berger fails to teach or suggest either of these two types of silicone compounds, Claims 3, 5-8, 18, 20, and 31 have not been rendered obvious.

4. Claim 32 is patentable under 35 U.S.C. § 103(a) over U.S. Patent No. 4,499,149 to Berger.

Claim 32 is dependent on Claim 18 and contains a list of possible silicone compounds that are within the scope of the formulas of Claim 18. Each of the claimed compounds has only hydrocarbon terminal groups. Because Berger does not teach or suggest a silicone compound having only hydrocarbon terminal groups Berger cannot render Claim 32 obvious.

IX. CONCLUSION:

In view of the foregoing, it is urged that the final rejection of Claims 3, 5-8, 18, 20, and 31-33 be overturned and the Claims allowed. The final rejection is in error and should be reversed.

If there are any additional charges with respect to this Brief, please charge them to
Deposit Account No. 07-0862 maintained by the Assignee.

Respectfully submitted,

CANTOR COLBURN, LLP
Applicant's Attorneys

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APPENDIX A

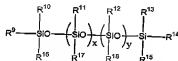
1 - 2. (Canceled)

3. (Previously presented) An anti-fog coating composition comprising a silicone compound free from a sulfonic acid functional group; a water dispersible polyurethane compound; and an aqueous solvent, wherein the silicone compound is of the formula:



wherein the subscripts a, c, d, e, f, and g are zero or a positive integer, subject to the limitation that the sum of the subscripts b, d, and f is one or greater; M has the formula: $R^1_3 SiO_{1/2}$, wherein each R^1 is independently a monovalent hydrocarbon radical having from one to forty carbon atoms; M' has the formula: $R^2_{3-h} R^3_h SiO_{1/2}$, wherein each R^2 and R^3 are independently monovalent hydrocarbon radicals having from one to forty carbon atoms, and the subscript h is 1, 2, or 3; D has the formula: $R^4_2 SiO_{2/2}$, wherein each R^4 is independently a monovalent hydrocarbon radical having from one to forty carbon atoms; D' has the formula: $R^5_{2-i} R^6_i SiO_{2/2}$, wherein each of R^5 and R^6 is independently a monovalent hydrocarbon radical having from one to forty carbon atoms, and the subscript i is 1 or 2; T has the formula: $R^7 SiO_{3/2}$, wherein each R^7 is a monovalent hydrocarbon radical having from one to forty carbon atoms; T' has the formula: $R^8 SiO_{3/2}$, wherein R^8 is a monovalent hydrocarbon radical having from one to forty carbon atoms; and Q has the formula: $SiO_{4/2}$,

or an ionic or nonionic siloxane alkoxylate of the formula:



wherein each of R^9 through R^{17} are independently a monovalent hydrocarbon radical, and R^{18}

is $R^{19}-Z-(C_mH_{(2m+1)}R^{20}O)_j(C_nH_{2n}O)_kR^{21}$, wherein m and n are integers greater than or equal to 0; j and k are integers greater than or equal to 0, subject to the proviso that the sum of $j + k$ is greater than or equal to 1; Z is $-O-$, $-S-$, $-CO-$, $-NH-$, or $-NH_2-$; R^{19} is a divalent hydrocarbylene radical, R^{20} and R^{21} are independently hydrogen, alkyl, hydroxyalkyl, amino, amide, amineoxide, cyano, isocyanate, aryl, arylene, carboxy, alkoxy, halogen, haloalkyl, haloalkoxy, sulfo, sulfamo, phosphono, salts thereof, or a combination comprising at least one of the foregoing moieties, and wherein x and y are integers greater than or equal to 0, subject to the proviso that $x + y$ is greater than or equal to 1.

4. (Canceled)

5. (Previously presented) The coating composition according to Claim 3, further comprising an additive, wherein the additive is a UV absorber, an antistatic agent, pigments, photosensitizing agents, fillers, dyes, fungicidal, bactericidal and anti-microbial agents, particulates which control the friction or surface contact areas, defoamers, buffers to control pH of the coating compositions, corrosion inhibitors, or a combination comprising at least one of the foregoing additives.

6. (Previously presented) The coating composition according to Claim 3, further comprising a co-solvent, wherein the co-solvent is N-methyl pyrrolidone, glycol ether, isopropanol, or a combination comprising at least one of the foregoing co-solvents.

7. (Previously presented) The coating composition according to Claim 3, wherein the silicone compound is chemically bound to the polyurethane compound.

8. (Previously presented) The coating composition according to Claim 6, wherein the co-solvent present in the coating composition is about 5 to about 10 parts by weight based on the total weight of the coating composition.

9. - 17. (Canceled)

18. (Previously presented) A glass or plastic article having an anti-fogging surface comprising:

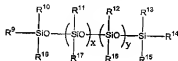
a glass or plastic substrate; and

an anti-fog coating disposed on at least one surface of the substrate, the anti-fog coating comprising a silicone compound free of a sulfonic acid function group; a water dispersible polyurethane compound; and water, wherein the silicone compound is of the formula:



wherein the subscripts a, c, d, e, f, and g are zero or a positive integer, subject to the limitation that the sum of the subscripts b, d, and f is one or greater; M has the formula: $R^1_3 SiO_{1/2}$, wherein each R^1 is independently a monovalent hydrocarbon radical having from one to forty carbon atoms; M' has the formula: $R^2_{2h} R^3_h SiO_{1/2}$, wherein each R^2 and R^3 are independently monovalent hydrocarbon radicals having from one to forty carbon atoms, and the subscript h is 1, 2, or 3; D has the formula: $R^4_2 SiO_{2/2}$, wherein each R^4 is independently a monovalent hydrocarbon radical having from one to forty carbon atoms; D' has the formula: $R^5_i R^6_i SiO_{2/2}$, wherein each of R^5 and R^6 is independently a monovalent hydrocarbon radical having from one to forty carbon atoms, and the subscript i is 1 or 2; T has the formula: $R^7 SiO_{3/2}$, wherein each R^7 is a monovalent hydrocarbon radical having from one to forty carbon atoms; T' has the formula: $R^8 SiO_{3/2}$, wherein R^8 is a monovalent hydrocarbon radical having from one to forty carbon atoms; and Q has the formula: $SiO_{4/2}$,

or an ionic or nonionic siloxane alkoxy/silicate of the formula:



wherein each of R^{17} are independently a monovalent hydrocarbon radical, R^{18} is of the general formula: $R^{19}-Z-(C_mH_{2m-1})_jR^{20}O_k(C_nH_{2n}O)_kR^{21}$, m and n are integers greater than or equal to 0; j and k are integers greater than or equal to 0, subject to the proviso that the sum of $j+k$ is greater than or equal to 1; Z is $-O-$, $-S-$, $-CO-$, $-NH-$, or $-NH_2-$; R^{19} is a divalent hydrocarbylene radical, R^{20} and R^{21} are independently hydrogen, alkyl, hydroxyalkyl, amino, amide, amineoxide, cyano, isocyano, aryl, arylene, carboxy, alkoxy, halogen, haloalkyl, haloalkoxy, sulfo, sulfamo, phosphono, salts thereof, or a combination comprising at least one of the foregoing; and wherein x and y are integers greater than or equal to 0, subject to the proviso that $x+y$ is greater than or equal to 1.

19. (Canceled)

20. (Previously presented) The article of Claim 18, wherein the plastic substrate comprises polycarbonate, cellulose esters, polystyrene, polyvinyl acetate, polyolefins, or polyester.

21. - 30. (Canceled)

31. (Previously presented) The coating composition according to Claim 3, wherein the silicone compound is present in the coating composition at about 0.1 to about 20 parts by weight and the water dispersible polyurethane polymer is present at about 5 to about 50 parts by weight based on 100 parts by weight total of silicone compound, water dispersible polyurethane, and the aqueous solvent.

32. (Previously presented) The coating composition according to Claim 3, wherein the silicone compound is poly[(dimethylsiloxane-co-methyl(3-hydroxypropyl)siloxane)-graft-poly(ethylene glycol) methyl ether; poly[(dimethylsiloxane-co-[3-[2-(2-hydroxyethoxy)ethoxy]propyl)methylsiloxane]; poly[(dimethylsiloxane-co-(3-aminopropyl)methylsiloxane)]; poly[(dimethylsiloxane-co-methyl(3-hydroxypropyl)siloxane)-graft poly(ethylene/propylene glycol) methyl ether; poly[(dimethylsiloxane-co-methyl(3-hydroxypropyl)siloxane)-graft-tetrakis(1,2-butylene

glycol); poly(dimethylsiloxane-co-alkylmethylsiloxane); poly(dimethylsiloxane-co-methyl(stearoyloxyalkyl)siloxane); poly(dimethylsiloxane-co-methyl(3-hydroxypropyl)siloxane)-graft-poly(ethylene/propylene glycol); poly(dimethylsiloxane-co-methyl(3-hydroxypropyl)siloxane)-graft-poly(ethylene glycol) [3-(trimethylammonio)propyl chloride; poly(dimethylsiloxane-co-methyl(3-hydroxypropyl)siloxane)-graft-poly(ethylene glycol) 3-aminopropyl ether; poly(dimethylsiloxane-co-methyl(3,3,3-trifluoropropyl)siloxane); poly(dimethylsiloxane bis[[3-[(2-aminoethyl)amino]propyl]dimethoxysilyl] ether; poly(dimethylsiloxane) ethoxylate/propoxylated; or a combination comprising at least one of the foregoing silicone compounds.

33. (Previously presented) The coating composition according to Claim 18, wherein the silicone compound is poly(dimethylsiloxane-co-methyl(3-hydroxypropyl)siloxane)-graft-poly(ethylene glycol) methyl ether; poly(dimethylsiloxane-co-[3-[2-(2-hydroxyethoxy)ethoxy]propyl]methylsiloxane); poly(dimethylsiloxane-co-(3-aminopropyl)methylsiloxane); poly(dimethylsiloxane-co-methyl(3-hydroxypropyl)siloxane)-graft poly(ethylene/propylene glycol) methyl ether; poly(dimethylsiloxane-co-methyl(3-hydroxypropyl)siloxane)-graft-tetakis(1,2-butylene glycol); poly(dimethylsiloxane-co-alkylmethylsiloxane); poly(dimethylsiloxane-co-methyl(stearoyloxyalkyl)siloxane); poly(dimethylsiloxane-co-methyl(3-hydroxypropyl)siloxane)-graft-poly(ethylene/propylene glycol); poly(dimethylsiloxane-co-methyl(3-hydroxypropyl)siloxane)-graft-poly(ethylene glycol) [3-(trimethylammonio)propyl chloride; poly(dimethylsiloxane-co-methyl(3-hydroxypropyl)siloxane)-graft-poly(ethylene glycol) 3-aminopropyl ether; poly(dimethylsiloxane-co-methyl(3,3,3-trifluoropropyl)siloxane); poly(dimethylsiloxane bis[[3-[(2-aminoethyl)amino]propyl]dimethoxysilyl] ether; poly(dimethylsiloxane) ethoxylate/propoxylated; or a combination comprising at least one of the foregoing silicone compounds.